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Review Article

Impact of television on children: An umbrella review

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ABSTRACT

This umbrella review provides a comprehensive synthesis of research on the effect of television (TV) consumption on children and adolescents. The analysis encompasses a wide range of factors, such as patterns in the duration of time spent on screens, the relationship between the use of TV and different areas of development, as well as the impacts on health, behavior, and learning. The review synthesizes results from other systematic reviews and meta-analyses, providing a comprehensive outlook on the influence of TV on the lives of young viewers.

Keywords: Adolescent behavior, Behavioral outcomes, Child development, Cognitive effects, Health impact, Media influence, Screen time, Television viewing

INTRODUCTION

Research conducted before to 2004 revealed that adolescents consume an average of 1.8–2.8 h of television (TV) content daily, with variations based on their age and gender. The majority of TV viewers, or 66% of the total, were categorized as "low users" due to their daily viewing time of <2 h. However, a significant portion of 28% watched more than 4 h each day. Male and female individuals who had the opportunity to play computer games spent approximately 60 and 23 min/day watching TV, respectively. The daily computer usage increased by an additional 30 min. Age-stratified data indicated that adolescents exhibited reduced TV consumption, whereas individuals who were classified as "high users" during their youth were more likely to maintain high usage patterns as they aged. There has been no significant increase in the duration of time that children with TV access spend viewing TV over the past 50 years, up until 2004.[1]

Studies conducted in 2004 and 2014 examined the period of time children spent using screens. The findings revealed that toddlers in center-based childcare spent an average of 0.1–1.3 h/day watching TV, while those in home-based childcare spent between 1.8 and 2.4 h/day engaged in this activity. There was an inverse correlation between the level of staff education and the amount of screen time children had while in childcare. In addition, the kind of childcare arrangement, specifically home-based childcare compared to center-based daycare, was directly correlated with children's screen time.[2]

Since 2015, there has been a significant increase in the annual publication of articles examining the correlation between TV and mobile device usage. The increasing abundance of narratives indicates a rising inclination among individuals to ascertain the extent of time that young children dedicate to screen activities.[3]

According to a recent analysis of 53 scientific studies, the percentage of children who exceeded 2 h of daily TV viewing increased from 42% to 60% following the COVID-19 epidemic.[4]

In 2016, the American Academy of Pediatrics performed a narrative review to evaluate the benefits and drawbacks of electronic media on children and adolescents.[5] This review provided the basis for amending their TV consumption rules.[6] Subsequently, numerous systematic review and meta-analysis (SRMAs) have presented evidence regarding the potential advantages and drawbacks of TV usage. Prior examinations of TV usage evaluations have typically concentrated on a specific area, such as health,[7] or a particular aspect, such as social media[8,9] exposure. In addition, these examinations often just offer a descriptive assessment of the existing literature.[10] Concentrating on a certain area or aspect makes it challenging to comprehend the compromises associated with any recommendations on TV usage. For instance, implementing a ban on TV usage could decrease exposure to advertisements, but it could also hinder the potential for learning through educational resources. Evaluations of either of these exposures or outcomes would probably be inadequate in quantifying these trade-offs.

Overviews constitute a method of evidence synthesis that adeptly addresses these trade-offs by providing accessible summaries of a certain research domain. The discipline uses these summaries as a point of reference, and they make it easier to assess the benefits and drawbacks of the same behavior. Through analogy, reading can be considered a sedentary activity. To provide unambiguous advice for children, parents, and young people, researchers and policymakers must compare the health dangers with the educational benefits.

To consolidate the data and facilitate the development and improvement of evidence-based guidelines, we conducted a study of published SRMAs that investigate the effect of TV usage on children. This review compiles evidence regarding the impact of TV exposure on any given result. To optimize TV interaction, this analysis offers data that might be utilized to create recommendations and guidelines for pediatricians, parents, educators, and other professionals. The evidence is obtained by analyzing various aspects of life, such as school and home.

MATERIAL AND METHODS

Eligibility criteria

Population

To qualify for inclusion, SRMAs were required to encompass individuals who are children or adolescents, aged between 0 and 18 years. As long as the mean age was <18, a systematic review and/or meta-analysis was included even if the age range was larger than 18. In particular, we excluded SRMAs that only contained data gathered from those older than 18.

Exposure

We incorporated SRMAs that investigated TV, as well as assessments encompassing all forms of material available on these devices, such as content (e.g., movies and games). This review specifically examined TV exposure that is representative of what is often experienced by children and adolescents. That is, the potential for being exposed to something in one's own house or while attending school. In line with this methodology, we omitted technology-driven therapies for medical disorders. However, our analysis included studies that looked at how screen time affected learning and other non-clinical outcomes, particularly in kids and teenagers with a clinical diagnosis. For example, the inclusion criteria may include a meta-analysis that looks at how TV viewing affects academic learning in teenagers with a diagnosis of depression.

Outcomes

We have incorporated all documented results about the advantages and potential drawbacks.

Publications

We included quantitative data SRMAs, also known as meta-regressions. SRMAs which had data from publications that have been found through a systematic review were taken into consideration. According to our study's definition, a systematic review is an extensive attempt by the authors to compile all pertinent research data pertaining to their research topic or questions. We excluded SRMAs that did not seek to provide a thorough summary of all the material currently available, such as a meta-analysis that only included studies from a single laboratory.

As long as the studies in the review collected quantitative data, we took into account SRMAs irrespective of the study types that were included (e.g., laboratory-based experimental studies, randomized controlled trials, non-randomized controlled trials, longitudinal, cross-sectional, and case studies). Systematic reviews that concentrated on qualitative evidence were not included in the study. To help with the interpretation of the results, we did, however, use a risk of bias tool. Comprehensive, peer-reviewed SRMAs published or in the process of being published in English were included in our analysis. We excluded unpublished systematic reviews and/or meta-analyses, as well as conference abstracts, from our analysis.

Sources of information

We conducted a comprehensive search of the following databases: PubMed, MEDLINE, CINAHL, PsycINFO,

SPORTDiscus, Education Source, Embase, Cochrane Library, Scopus, Web of Science, ProQuest Social Science Premium Collection, and ERIC. We performed an initial search on October 15, 2023, and subsequently updated the search on November 5, 2023. To find any more meta-analyses that fit our eligibility requirements, we carefully reviewed the reference lists of the publications that were part of our analysis. Furthermore, we searched PROSPERO for relevant processes and contacted authors to find out whether these reviews were completed and published.

Search strategy

Supplementary Data 1 includes the search strategy for each of the 12 databases. To locate any SRMAs that might have gone unnoticed in our first search, we manually searched the reference lists of pertinent umbrella reviews.

Process of selecting

Both researchers conducted a thorough examination of all titles and abstracts using Rayyan. Subsequently, two scholars conducted a thorough examination of the complete publications. Any disagreements that arose at any point during the procedure were resolved by consensus, with the assistance of a third researcher if required.

Elements of information

Two researchers separately extracted data from each integrated SRMAs and entered it into a specially designed database. First author, publication year, study design (e.g., cross-sectional, observational, and experimental), publishing dates, sample age (mean), recorded lowest and highest mean age, reported exposures, and reported results are among the items that were retrieved.

Evaluation of potential biases in a study

For every SRMAs, two researchers independently used the Quality Assessment of Systematic Reviews and Meta-analyses tool[11] [Supplementary Table 1]. When necessary, a third researcher was consulted to resolve disagreements through consensus. The possibility of bias in the individual studies included in each meta-analysis was not assessed by us.

Methods of synthesis

After extracting the data, we examined the different exposure and result combinations. Any duplicate effects discovered across several subgroups in a single meta-analysis or in multiple SRMAs were discarded.

RESULTS

The searches produced a total of 21435 outcomes, out of which 11021 were identical copies. Following the evaluation of titles and abstracts, we examined 2649 complete texts to determine their eligibility for inclusion. Out of them, 110 satisfied the criteria for inclusion, and we collected the data from all these SRMAs. The complete

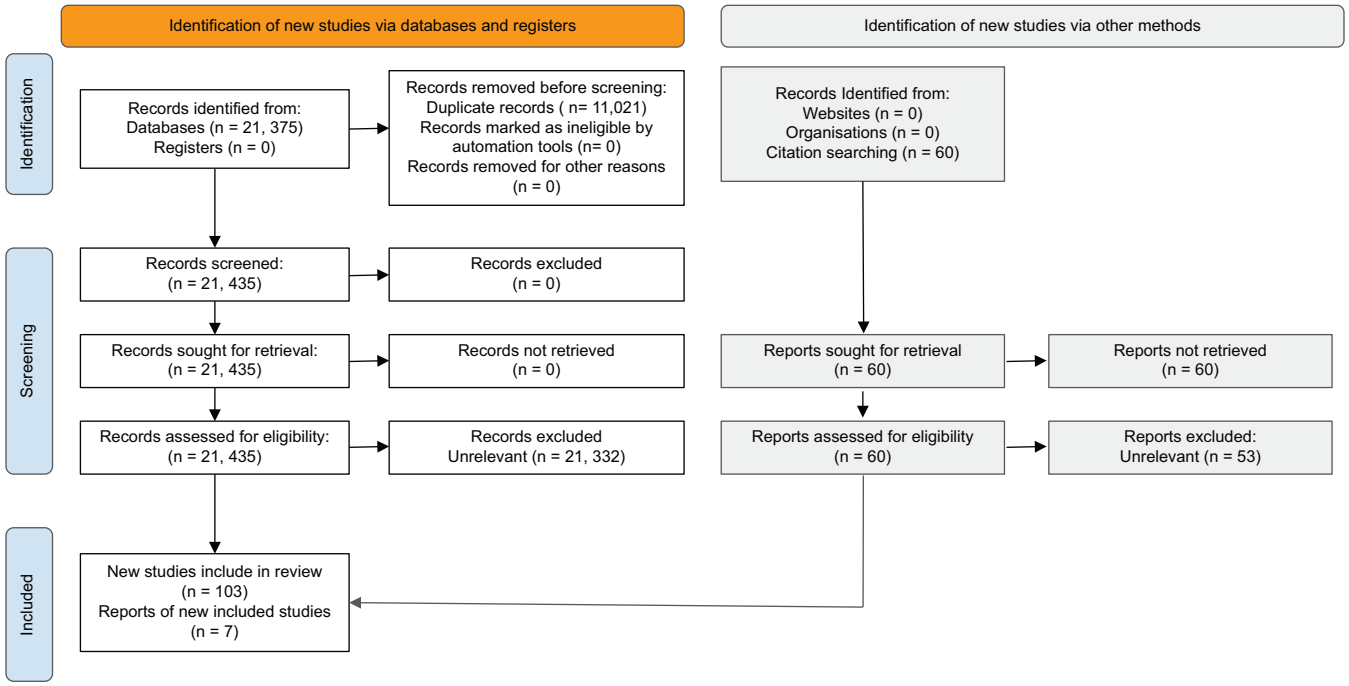

Figure 1: Diagram illustrating the flow of preferred reporting items for systematic reviews and meta-analyses.

outcomes of the selecting process[12] are depicted in Figure 1.

The Supplementary Data 2 attachment contains the study specifics. General screen use (n = 27), general TV shows and movies (n = 20), and TV-based health promotion efforts (n = 14) were the most commonly reported exposures. Body composition (n = 30), general learning (n = 24), sadness (n = 13), and general literacy (n = 12) were the most frequently reported outcomes. The study's SRMAs were of excellent quality [Supplementary Table 1].

DISCUSSION

This review's primary goal was to present a thorough analysis of the relationship between TV use and several aspects of kids' lives that are related to health. All things considered, the SRMAs discovered strong evidence of potentially harmful relationships with depression, body composition, literacy, and general learning.

TV and violence

Researchers found conflicting evidence in a 2009 study about the relationship between violent behavior in children and adolescents with behavioral and emotional issues and watching TV and playing video games.[13] The best ways to investigate the effects of violent media on kids and teenagers, as well as how severe these effects are, are still up for debate. Violent imagery on TV, in films and videos, and in video games has strong direct effects on arousal, cognition, and emotions, according to the SRMA, which incorporates academic research from North America. These effects make aggressive or fearful behavior more likely, especially in younger children, especially boys. There is frequently inconsistency in the data pertaining to older kids, teens, and long-term results for all age groups.[14]

The extensive 2020 review study, which examined 4381 papers from various countries, discovered a positive correlation between excessive TV consumption among children and adolescents and an increased propensity for violent behavior, including engagement in physical altercations as well as assuming the roles of victim or aggressor.[15]

Psychological effects of TV

Anger, inattention, and defiance were among the behavioral problems that were positively correlated with increased screen usage, according to the SRMA, which had a total sample size of 159,425 children with an average age of 6 years. In addition, they had a higher propensity for internalizing behavioral issues such as anxiety and sadness, somatic symptoms, and feelings of inadequacy.[16]

The comprehensive evaluation conducted in Canada analyzed 235 studies involving a total of 1,657,064 distinct participants from 71 diverse nations. The findings revealed a multitude of detrimental consequences associated with prolonged screen usage. Longer periods of computer gaming and TV watching were linked to less pro-social behavior and more negative behavior. Higher academic achievement was found to be positively connected with longer reading and assignment completion times. Reduced physical activity (PA) was linked to increased screen time. Carson *et al*. in 2016[17] reported a correlation between low self-esteem and increased screen time or computer usage.

TV and depression

A total of 12,714 individuals participated in a study that was published in.[17] According to a study, children and teenagers who use screens more frequently are more likely to experience depression. Compared to the control group that did not use screens, a non-linear dose-response relationship between screen use and a lower chance of feeling sad was found. According to Liu *et al*., the least amount of danger was observed when individuals spent only 1 h each day using screens.[18]

TV and diet

According to an analysis of data from 266 research, a sizable percentage of food ads that air during children's TV shows promote foods that may be harmful to their dental health. Furthermore, the advertisements began to prioritize food products that appeared to be nutritious but, in reality, contain a significant amount of concealed sugar.[19]

One review article also revealed the prevailing strategies employed by food advertisements on TV to persuade children to consume their products. The utilization of special offers, advertising figures, assertions on nutrition and health, the focus on flavor, and the emotional appeal of enjoyment were the key elements employed. It is important to recognize and record the persuasion marketing strategies that are frequently used to promote food to children on TV. This is required to keep an eye on industry commitments and advertising regulations, as well as to create additional norms in this area.

Advergames are a new and distinct kind of advertising. The primary objective of advergames is to stimulate consumer purchases of the company's core product.[20]

Advergaming is a marketing strategy that integrates advertising within video games. Individuals have a significantly higher inclination to engage with a company and its products when they are promoted through enjoyable games as opposed to bothersome pop-ups or conventional

advertisements. Consequently, it influences the level of knowledge and confidence individuals have in a brand.

As an illustration

Crazy taxi

Crazy Taxi is a 1999 racing video game [Figure 2]. Within the game's universe, the player assumes the role of a taxi driver and earns income by doing daring maneuvers while transporting passengers to their desired locations. The game features renowned real-world establishments such as Pizza Hut, FILA sportswear shops, Levi's stores, and KFC, enhancing the sense of authenticity.

Doritos virtual reality (VR) battle

Companies are increasingly adopting emerging technologies such as VR in their marketing strategies due to its growing accessibility. This action game requires players to navigate the game's virtual environment and engage in combat with malevolent creatures resembling demons, all while gathering Doritos as a form of in-game currency [Figure 3].

Figure 2: A screenshot of CrazyTaxi that shows the Pizza Hut look.

Figure 3: A screenshot of VR Battle with Doritos ad. VR: Virtual reality.

Empirical data suggests that exposure to advertisements promoting unhealthy food on electronic screens significantly increases children's consumption of those items.

Between 1980 and April 2018, the review conducted in various languages consistently revealed that children who extensively engaged with screens tended to consume more food as a result of exposure to TV advertisements and advergames. In addition, the study found that children who played advergames and watched food commercials on TV ingested an average of 60.0 kcal more than children who watched commercials for non-food products. The results also showed that children's food consumption and their exposure to food commercials on TV were correlated and predictive. Ads for unhealthy meals on TV and in video games cause children to immediately consume more calories.[21]

Many people agree that children are more likely to develop obesity and non-communicable diseases if they are exposed to commercials that promote unhealthy meals and beverages. Several persuasive strategies are used in food marketing to change children's food consumption, preferences, and perceptions.

The Australian comprehensive review offers a thorough summary of how various marketing strategies affect kids ages 0–18. The Australian comprehensive review provides a comprehensive overview of the impact of different marketing methods on children aged 0–18. Evidence indicates that food marketing exerts significant adverse impacts, including the alteration of children's attitudes and preferences, as well as increasing their consumption of the advertised foods. The impact of these effects is particularly pronounced for marketing strategies employed in TV and film, as well as on product packaging.[22]

Several researches have established a correlation between childhood obesity and TV viewing. The review, including 61,674 children, revealed that the act of having family meals does not compensate for the detrimental effects on their health caused by viewing TV during mealtime. Youngsters who eat while watching TV are more likely to consume sugary drinks and less fruits and vegetables overall.[23]

Extended durations of computer usage and increased frequency of TV viewing were associated with problems related to body composition. There was a correlation between higher clustering cardiometabolic risk scores and increased duration or frequency of TV viewing.[17]

Excessive screen usage is linked to sedentary behavior, which is linked to an increased risk of cardiovascular issues. A comprehensive analysis of 22 studies conducted across four regions and 12 countries examined a total of ninety-four factors. The findings revealed a significant correlation between increased TV consumption by parents and higher screen time among their children. Furthermore, early

exposure to excessive screen usage was associated with both increased screen time and sedentary behavior. Furthermore, it was discovered that having a computer or TV in the bedroom was associated with more sedentary leisure activities.[24]

TV and higher mental functions

According to a study of 480,479 kids between the ages of 4 and 18, watching TV was negatively correlated with academic success in language and arithmetic. There was an inverse correlation between the number of video games an individual played and their overall score. Subsequent analyses revealed that engaging in TV viewing was found to have a detrimental association with language proficiency in children. However, it was discovered that only among teenagers did watching TV and playing video games have a negative correlation with overall scores.[25]

Education and public health professionals should consider ways to improve academic achievement for kids and teens who participate in these activities. This can be accomplished by restricting kids access to such activities and maintaining close monitoring.

A comprehensive analysis encompassing 18,905 individuals across 42 studies revealed a significant association between increased computer usage and diminished language proficiency, as well as exposure to background TV. Children who engaged in a greater amount of high-quality screen time, such as instructional shows, demonstrated superior speaking abilities. According to Eirich *et al*., children who possess superior linguistic abilities are also more inclined to delay their initiation of screen usage.[16]

According to a number of studies, reading, TV content tailored to children, and TV content tailored to adults all negatively impact cognitive development outcomes in 38%, 0%, 8%, and 25% of cases, respectively. Conversely, positive effects were noted in 6%, 60%, 13%, and 3% of instances. Ten studies out of the total number were judged to be of ordinary quality, and the other 27 were judged to be of poor quality.[17]

After examining the results of twelve carefully planned experiments, researchers found that educational TV shows significantly improve young children's cognitive skills, shape their racial attitudes, and stimulate their creativity. Nonetheless, there is evidence that watching cartoons may make it harder for kids to concentrate.[5]

TV, obesity, and lack of PA

Screen usage and body fat were found to be somewhat correlated in the 2017 cross-sectional data analysis. Longitudinal research, however, showed that these associations weakened over time. Studies that measured sedentary behavior using objective accelerometers found no correlations. Body mass index (BMI) or BMI-z values were the subject of most investigations.

Weight and obesity were not significantly affected by interventions meant to decrease sedentary behavior. Because many therapy therapies concurrently modify other behaviors, such as increased PA and dietary adjustments, it can be difficult to quantify the separate benefit of reducing sedentary behavior. The study looked at the relationship between obesity in adolescents and young adults and sedentary activity using the conventional Bradford Hill criteria.

Contrariwise, one review states that, there is a lack of substantial evidence to establish a significant correlation between the idleness of children and teenagers and their likelihood of becoming overweight. Furthermore, there are insufficient data to suggest a causal relationship between these factors. Measuring exposure, result, and conducting studies in this field remains complex, with numerous approaches available. Nonetheless, claims of "clear" links – specifically, causation – between obesity and a lack of PA in adolescents and young adults are either unfounded or premature.[26]

A preliminary analysis looked at the amount of time spent in front of screens without commercials and how it affected eating habits. Compared to activities that did not involve screens, screen time was consistently associated with higher dietary consumption when food advertising was absent. Diversions, problems with the body's satiety control, computer use linked to conditioned eating, memory consolidation problems, and the impact of the stress-induced reward system are some of the theories put out to explain this linkage. To improve our understanding of the relationship between dietary consumption and the amount of time spent in front of a screen without any adverts, more research is necessary. We also want to find any possible differences between other screen-based activities.[27]

TV and sleep

Children who engage in extensive screen time are more prone to have sleep difficulties. The study conducted on a sample of 4656 children between the ages of 2 and 14 examined strategies to reduce their screen time. The findings revealed that by advancing their bedtime by 0.16 h (equivalent to 10 min) on weekdays and by 1 h on weekends, children were able to decrease their daily screen time by 33 min and increase their sleep duration by 11 min. To summarize, children have the ability to implement minor adjustments in their screen time and sleep duration.[28]

In a different study covering 67 papers published between 1999 and early 2014, Stony Brook University researchers looked at the relationship between screen time – which

includes using computers, TVs, video games, and mobile phones – and sleep outcomes in school-age children and adolescents. According to the survey, youngsters did not get enough sleep in 90% of situations. In addition, the study discovered a link between screen usage and poor sleep quality. In particular, it was shown that children who spent more time on screens slept for shorter periods of time and fell asleep more slowly.[29]

TV and other health problems

According to a review of research done over the previous 30 years, children and teenagers who spend a lot of time on screens are more likely to acquire osteoporosis.[30] Recent studies have revealed a correlation between teenagers who spend a minimum of 3 h daily using electronic devices and an increased likelihood of experiencing non-specific low back discomfort. Despite the lack of statistical significance, this statement remains accurate based on the findings of Guerra *et al*.[31]

One scientific investigation has revealed that children under the age of 6 have a higher propensity to experience fatality, sustain cranial injuries, or necessitate hospitalization as a result of falling TVs.[32]

Interventions

Parents have a significant impact on their children's PA and sedentary habits, especially in the formative years of life. Using six electronic databases, a thorough evaluation of the research literature from January 1998 to November 2013 was carried out in November 2013.

The results show that while parents who set screen time limits for themselves can successfully lower their children's screen time, parental support and encouragement can raise kids' levels of PA. Xu *et al*.[33] assert that modifying parenting approaches, parenting styles, or parental self-efficacy can successfully motivate kids to spend less time on screens and more time outdoors. Eirich *et al*.[16] emphasize how important it is to help families apply evidence-based suggestions in an efficient manner.

Research indicates that there is a low global compliance rate among children aged 5 and below when it comes to adhering to screen time guidelines. Preschool-aged children appear to dedicate a considerable portion of their time to screen viewing throughout their time in daycare, particularly in home-based settings. This study also addressed the issue of preschoolers' adaptability to screen usage in daycare environments. Further investigation is required to examine the impact of screen time on babysitting.

The outcomes of interventions that restricted children's TV viewing shown increased PA levels and improved dietary habits, leading to positive benefits on weight management.[34]

According to a comprehensive analysis of 47 studies, the most effective methods for reducing screen time were identified as electronic TV tracking systems, contingent feedback systems, and counseling in a clinic.[35]

Assessing peak bone mass during adolescence is the most reliable indicator of an individual's susceptibility to osteoporosis. Therefore, bone health enhancement initiatives should incorporate measures to regulate screen usage.

It is essential to use more than just warning labels for tumbling TVs to prevent injuries. In addition to enforcing statutory safety regulations and educating people about the use of tip-restraint devices, we also need to get TV manufacturers to pledge to improve the stability of their products.

Given the detrimental effects of a sedentary lifestyle on children's well-being, a comprehensive analysis of 21 studies reveals that promoting a week without TV and implementing standing desks in educational institutions are effective strategies to reduce sedentary behavior among children. This study by Chinapaw *et al*. may provide valuable insights for research and policy development aimed at promoting a healthy childhood.[36]

Exercise duration, TV watching habits, VO_2 max, and blood cholesterol levels were significantly improved when PA programs were implemented in schools. Overall, systolic and diastolic blood pressure, BMI, pulse rate, and leisure-time PA levels were not significantly affected by school-based treatments. Positive results are at least obtained from the use of printed instructional materials and curriculum changes that encourage PA. Since PA in schools has no negative effects and seems to have some positive effects on lifestyle choices and physical health indicators, it is justified to continue advocating for it.[37]

Oral health is negatively impacted by unhealthful food and beverage surroundings, according to the majority of studies that have looked at the topic. According to a modeling study by Mackenbach *et al*.[38], enacting regulations targeted at enhancing the nutritional value of food and drink had a favorable effect on oral health.

Research gaps

The metrics used to quantify screen time have evolved to align with contemporary children's technology usage. However, the psychological ramifications of these assessment tools are sometimes overlooked in discussions. Enhanced measurements and reports are necessary to accurately quantify the duration of children's screen usage.

While babies constitute the most rapidly expanding demographic for TV viewership, the controlled research exclusively encompass children aged 3 years and above. Furthermore, the practical applicability of the findings remains

uncertain due to the limited sample sizes, absence of naturalistic settings in the research, and the fact that all but one of them solely examined the immediate consequences of TV viewing.

While many studies have demonstrated the efficacy of certain strategies in reducing children's screen usage, there are still certain areas that require further investigation. For instance, there is a scarcity of research that specifically targets children belonging to minority groups. Furthermore, there are few research examining the effects of taking TV's off of kids' beds and a lack of long-term follow-up data. Addressing these issues could improve the success of current initiatives to cut down on screen time and make them more accessible to a larger group of people.

Ultimately, various forms of sedentary behavior, such as watching TV versus reading, can potentially provide distinct impacts on the cognitive development of young children. Further investigation is required using robust and dependable methodologies, sufficiently large sample sizes, and a comprehensive examination of several cognitive domains, including language, spatial cognition, executive function, and memory.

Conducting comprehensive research entails developing explicit and dependable research methodologies and metrics, monitoring the prevalence of sexual content in media nationwide, and examining the varying degrees of exposure to such content among teenagers from different demographic backgrounds. In addition, conducting longitudinal studies is crucial to understanding how this exposure influences the sexual preferences, attitudes, and actions of adolescents over time. Additional areas of research focus on evaluating the effectiveness of various control measures in reducing exposure, as well as examining the impact of parental supervision and media literacy programs on this issue.[39]

There is contradictory information regarding the correlation between sedentary behavior in children and adults and the occurrence of memory issues. Further investigation is required to have a comprehensive understanding of these intricate interconnections. These studies should thoroughly examine the potential impact of exercise on these connections, considering both the possibility of change and the absence of change.[40] The connection between self-reported media consumption and logged measurements was relatively moderate (r = 0.38), according to a meta-analysis of 47 research.[41] However, self-reported problematic consumption showed an even weaker correlation (r = 0.25). While wearable cameras[42] and device-based recorders[43] have been introduced as newer ways for documenting screen behaviors, their adoption remains limited among researchers.

CONCLUSION

Our findings emphasize the necessity for the field to thoroughly evaluate the suitability of the phrase "screen use" when offering guidance to parents. Alternatively, our findings indicate that a more intricate and comprehensive depiction of the behaviors that need to be altered may be necessary. It might be more successful to encourage parents to support interactive educational activities while limiting exposure to commercials rather than suggesting that they limit screen time.

Accurately assessing the results of screen-use research is a major difficulty for the profession, which affects the validity of individual studies within this larger study. The majority of screen usage research rely mostly on self-reported data, which is not only prone to error but also lacks the nuance needed to understand the effects of screen use. Self-reported screen usage data is unreliable, according to research. The progress of screen-use research may be hindered until there is a broader availability and use of accurate, verified, and nuanced metrics.

There are certain advantages and disadvantages to our work. This umbrella review's primary goal was to provide a thorough overview of TV use research by examining different exposure levels and how they relate to a variety of outcomes. The information we provide is derived from 110 primary studies. When possible, we removed and reanalyzed the data from each individual experiment to make it easier to compare the outcomes using a standardized assessment.

The comprehensive strategy we employ restricts the possibility of analyzing intricate specifics of the individual research. Consequently, we made determinations regarding the reliability of evidence, employing criteria and measurements that may have diverged from those of others. Furthermore, when confronted with multiple combinations of outcomes and exposures, we opted to retain the one with the greatest aggregated sample size, under the assumption that this would encompass the most extensive and up-to-date review.

Due to our high-level approach, we were unable to go into the exact mechanisms underlying each correlation. Therefore, we cannot make definitive statements about the cause-and-effect relationships. These factors likely vary based on the particular level of exposure and resulting effect. The connections between TV screen use and these outcomes may lead us to assume a causative relationship, but we cannot definitively exclude the possibility of reverse causality, the presence of a third variable, or a mixture of several factors. The individual reviews provided in-depth analysis of the robustness of the evidence supporting causal connections.

In addition, reviews only provide information from the past, which might not be consistent with the changing ways that children may use screens. Although our review of the available data provides some insight into the possible effects of screens on kids in the past, it is unclear if these conclusions will hold true for new technologies in the future.

Parental concerns, the wide number of academic disciplines engaged, and the growing frequency of screen use in society all demonstrate how popular this topic is. Our study's findings suggest that screen time has both positive (e.g., educational video games have been demonstrated to improve literacy abilities) and negative (e.g., overall screen time has been connected to poorer body composition) consequences. Based on our research, we recommend that parents, educators, and other caregivers carefully evaluate the information on the benefits and drawbacks of each activity to identify the possible dangers and benefits. This means putting more focus on analyzing the content, context, and environment in which the exposure occurs rather than on metrics that aggregate screen usage statistics.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent was not required as there are no patients in this study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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